IN THE CLAIMS:

1.-5. (Cancelled)

6. (Currently Amended) A semiconductor manufacturing apparatus for processing a semiconductor wafer, comprising:

a unit for generating a plasma in a vacuum chamber;

a wafer stage for holding a semiconductor wafer introduced into said vacuum chamber;

a high frequency power supply for applying a high frequency voltage to said wafer stage;

a current and voltage probe for measuring a voltage and a current applied to said wafer stage from said high frequency power supply;

a calculating portion for obtaining an impedance at a position of said current and voltage probe on the basis of a voltage value or a current value measured by said current and voltage probe, and arithmetic processing a combined impedance of the obtained impedance and an equivalent circuit model from said current and voltage probe to earth through said wafer stage, said equivalent circuit model being prepared beforehand, thereby to calculate at least one of a wafer voltage (Vw) and an impedance (Zp) from said semiconductor wafer to earth through the plasma; and

a processing portion for performing a processing on the basis of at least one of the calculated wafer voltage (Vw) and the calculated impedance (Zp).

7. (Currently Amended) A semiconductor manufacturing apparatus according to claim 6, wherein said processing portion displays at least one of the calculated wafer voltage (Vw) and the calculated impedance (Zp) on a display portion.

8. (Currently Amended) A semiconductor manufacturing apparatus according to claim 6, wherein said processing portion controls various processing parameters on the basis of at least one of the calculated wafer voltage (Vw) and the calculated impedance (Zp).

9. (Currently Amended) A semiconductor manufacturing apparatus according to claim 8, wherein said processing portion regards the calculated impedance as an impedance from said semiconductor wafer to an inner wall of said vacuum chamber through the plasma, and controls various parameters on the basis of at least one of the calculated wafer voltage (Vw) and the calculated impedance (Zp).

10. (Original) A semiconductor manufacturing apparatus according to claim 6, wherein said various parameters include a frequency of the high frequency voltage for generating said plasma or power, or the frequency or power of the high frequency voltage applied to said wafer stage, or a temperature or a temperature distribution of the wall forming said vacuum chamber, or a temperature or a temperature distribution of said semiconductor wafer; or at least any one of a pressure of said vacuum chamber, a kind of gases supplied to said vacuum chamber or a flow rate or a mixture ratio of the gases; or at least one kind of a magnetic field applied to the inside of said vacuum chamber, or an etching time.

11.-28. (Cancelled)

29. (Previously Presented) A wafer voltage probe in a semiconductor manufacturing apparatus for processing a semiconductor wafer, comprising:

a contact needle having electrical conductivity and adapted to contact a rear surface of the semiconductor wafer to be measured;

a resilient member having electrical conductivity for supporting said contact needle; and

a current introducing terminal having a flange structure for supporting said resilient member,

wherein, a voltage of said contact needle is measurable from the atmospheric side, and a position of said contact needle in a height direction is adjustable from the atmospheric side.